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# **Faculty Working Papers**

**HOW TO ASK QUESTIONS ABOUT DRINKING AND SEX:  
RESPONSE EFFECTS IN MEASURING CONSUMER BEHAVIOR**

**Ed Blair and Seymour Sudman**

**#312**

**College of Commerce and Business Administration  
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HOW TO ASK QUESTIONS ABOUT DRINKING AND SEX:  
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Market researchers often encounter response effects in measuring consumer behavior. This paper reports a nationwide study of response effects. Almost 1200 respondents answered threatening behavioral questions presented in various formats. Study results indicate that threatening questions requiring yes or no answers can be asked in any format, but that threatening questions requiring quantitative answers should be asked in open-ended, long questions with respondent-familiar wording.



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Introduction

Market researchers tend to assume that errors of measurement are variables with a mean of zero and independent of the "true" score. It is assumed that there is some sort of error attached to a particular measurement of each individual, but that over a sample of homogeneous individuals, the mean of the measurement errors will tend toward zero and the group mean will thus approximate the true score for the group. Since market researchers rarely are interested in the single individual, the comfortable assumption of measurement error as a variable with a mean of zero can lead to ignoring problems of measurement error and response effects. Response effects are defined as the difference between "true" score and obtained response, standardized by dividing this difference by the standard deviation of response. Unfortunately, such an assumption often is not sensible, particularly in regard to questions which make the respondent uneasy.

Strong evidence supports the intuitive belief that response effects in surveys increase as questions become more threatening. Sudman and Bradburn (18) summarize the literature prior to 1974 on this topic, including studies by Cannell and Fowler (1), Clark and Wallin (2), Clark and Tiffet (3), David (4), Ellis (5), Kahn (7), Kinsey, Pomeroy and Martin (8), Knudsen, Pope and Irish (9), Lev inger (10), Mudd, Stein and Mitchell (13), Poti, Chakraborti and Malaker (14), Sarason (15, 16, 17), Thorndike, Hagen and Kemper (19),



U.S. National Center for Health Statistics (21), Wallin and Clark (22), Yaukey, Roberts and Griffiths (23), and Young (24). Locander (11) and Locander, Sudman and Bradburn (12) report more recent experiments.

Also, empirical evidence shows that the impact of question threat is mediated by several variables, particularly question structure and question length. Sudman and Bradburn (18) make the following conclusions about these variables and question threat. Question structure and question length do not affect response effects for non-threatening questions. For threatening questions, closed-ended questions elicit negative response effects (underreporting), perhaps because closed endings increase question threat by forcing the respondent to choose one from a number of alternatives. Closed-ended questions also seem more sensitive to social desirability factors, resulting in depressed reporting for closed-ended questions about socially sensitive behavior or attitudes. Open-ended questions thus seem most appropriate for threatening topics. Response effects for threatening items decrease with increasing question length, suggesting that padded questions exceeding 30 words are most appropriate for threatening topics, and refuting the accepted maxim of making questions as short as possible. Sudman and Bradburn note that these conclusions necessarily generalize from several highly specific studies, and that large scale field research is needed to confirm these effects and to explore their interactions.

This paper reports a large scale investigation of question structure, question length and response effects. It also explores a new variable, wording familiarity. Sudman and Bradburn show that response effects for threatening items increase sharply with increasing average word length, a common surrogate for wording difficulty. Since standard questions which use simple, easy-to-understand words minimize response effects from this



source, a typical difficulty manipulation which increases wording difficulty is not sensible. Efforts to create a manipulation which would reduce wording difficulty led to the idea of asking respondents for their own words, particularly where standard words were not common words. This manipulation cannot be considered a simple difficulty manipulation. Familiar words may have relaxing effects which go beyond difficulty reduction in improving reporting. Familiar words also may have threatening effects which damage reporting, particularly when a closed-form response card presents street language variations of a standard word. Previous literature offers no clues about which result to expect, and this study tentatively hypothesized that increasing familiarity should have effects similar to decreasing difficulty. Issues of possible bias in using familiar wording are discussed in the methodology section of this paper.

#### Hypotheses

This research investigated three hypotheses:

Hypothesis 1: Open-ended questions will elicit higher reporting for threatening behavioral items than will closed-ended questions. (Threatening behavioral items invariably elicit underreporting, so that higher reporting can be interpreted as a reduction in negative response effect, rather than an increase in positive response effect. This point is substantiated in the validation of results section).

Hypothesis 2: Long questions (containing over 30 words) will elicit higher reporting for threatening behavioral items than will short questions.

Hypothesis 3: Familiar questions (defined in this study as questions using wording chosen by the respondent) will elicit higher reporting for threatening behavioral items than will questions employing standard, researcher-chosen wordings.



Methodology

A national sample of 1,200 adults (over 18 years of age) was drawn from the National Opinion Research Center's national master sample, using probability sampling with quotas. In each of the fifty areas which fell into the sample, the best interviewer currently available to NORC was used, to ensure maximum data quality. Interviewers who agreed to participate completed a practice case, and employment for the study was contingent upon a high-quality practice interview. 1,172 personal interviews were obtained for final analysis.

The same base questionnaire was used in all 1,172 cases. After answering questions about various leisure activities and about general happiness and well-being, respondents received questions on (in order) gambling, social activities, drinking alcohol, getting drunk, using marijuana, using stimulants and depressants, sexual activity, and descriptive items including income. Gambling, drinking, getting drunk, smoking marijuana, using stimulants and depressants, and sexual activity were thought to be threatening topics of serially increasing threat (responses to final questions about uneasiness regarding various questionnaire sections showed this presumption of threat order to be correct). Placing these items in invariant order of increasing threat was considered necessary to minimize breakoffs and item refusals. The fixed order also was justified by Sudman and Bradburn's (18) conclusions that order effects were minor in causing response effects, and that increasing interviewer-respondent rapport should depress negative response effects on later items (thus promising a conservative test of the hypothesized negative response effects).

Hypothesis testing occurred through a 2 x 2 x 2 factorial manipulation of threatening items on the base questionnaire. Open-ended questions versus



closed-ended questions formed a question structure manipulation. Closed-ended questions and open-ended questions were identical except for the closed-ended questions' provision of response categories. Long questions versus short questions formed a question length manipulation. Long questions and short questions were identical except for the long questions' use of at least 15 prefatory words. Familiar wording versus standard wording formed the final manipulation, question wording. Familiar wordings and standard wordings were identical except that for the familiar wordings the interviewer asked the respondent to suggest the wording to be used. The 2 x 2 x 2 design resulted in eight distinct questionnaires, each employing one combination of factor levels throughout all threatening items.

The question manipulations are best illustrated through an actual example. The questionnaire contained an item asking how many times in the past year respondents had become intoxicated. In the closed, short, standard questionnaire form (the form expected to obtain the poorest reporting), this item read:

In the past year, how often did you become intoxicated while drinking any kind of alcoholic beverage?

Respondents were handed a card listing these response categories:

- Never
- Once a year or less
- Every few months
- Once a month
- Every few weeks
- Once a week
- Several times a week
- Daily

In the open, long, familiar form (the form expected to obtain the best reporting), respondents first provided their own word for intoxication through this item:



Sometimes people drink a little too much beer, wine or whiskey so that they act different from usual. What word do you think we should use to describe people when they get that way, so that you will know what we mean and feel comfortable talking about it?

The intoxication item then read:

Occasionally, people drink on an empty stomach or drink a little too much and become (respondent's word). In the past year, how often did you become (respondent's word) while drinking any kind of alcoholic beverage?

No response categories were offered for either item.

There was some possibility that the familiarity manipulation might change the meaning of questions. A question about being high, with its broad frame of reference, may have a different meaning than a question about intoxication. The study results indicate that such shifting meanings did not occur. Descriptions used in soliciting respondents' words were quite specific, often using standard words such as intercourse or masturbation. Also, interviewers were instructed to use the standard word if respondents offered awkward or inappropriate words. Shifts in meaning would have been possible only for those few respondents who didn't understand the standard term, and for whom the familiar form defined that term.

All respondents answered one of the eight questionnaires. Each geographic segment sampled in the study contained eight cases, so that every form was used once in every segment. Starting form was randomized across segments to avoid sequence effects (such as interviewer practice effects). Interviewers typically did three segments each, or three replications of each form.



### Results and Discussion

The study results indicate that threatening items must be separated into two categories-- those items which ask about performing a behavior even once within some time span, and which require yes or no responses, versus those items which ask about the frequency or intensity (how often or how much) of a behavior, and which require some quantitative answer. Questions requiring yes or no responses showed no systematic, interpretable effects from the question length and wording familiarity manipulations (question structure was not amenable to manipulation for these items). Questions requiring quantitative answers proved consistently sensitive to the question structure and question length manipulations, though generally insensitive to the wording familiarity manipulation. Of course, non-threatening items elicited virtually flat reporting across questionnaire manipulations.

Table 1 shows the stability of yes or no responses across form manipulations. Percentages of respondents answering yes to the gambling items show ranges of less than 6 percentage points, indicating little variation in reporting. Percentages of respondents answering yes to the drinking and sexual activity items show similar ranges of less than 7 points. Almost none of these differences are statistically significant, and their shifting directionality suggests that none of them are practically significant. This stability of reporting indicates that question length and wording familiarity do not influence whether respondents will report having performed sensitive behaviors at least once. The decision to report any behavior always precedes the decision of how much behavior to report, even if the yes or no question is not asked explicitly. Apparently, respondents are not influenced by question length and by



wording familiarity in making that first decision.

Tables 2 and 3 indicate that the second decision, how much to report, is far more sensitive to question form manipulations. Long, open-ended questions were hypothesized as the best format for asking threatening items. These tables support that belief. Long, open-ended questions, with familiar wording where relevant, obtain the highest reporting in all of the Table 2 breakdowns. In addition, differences in reporting between these cells and the lowest cells are large. Long, open, familiar questions elicit more than double the reporting of short, closed, standard questions for all three drinking items. These consistent and sizable differences leave no doubt that open, long questions enhance reporting for threatening items of a "how much" or "how many" nature. Even when the differences are tested on an item by item basis, as in Table 3, the differences between open forms and closed forms and between long forms and short forms are either significant or nearly significant. Familiar wordings are not statistically superior to standard wordings, but the consistently good performance of the long, open and familiar format indicates that familiar wordings should be used unless inconvenient.

Note that both Table 2 and Table 3 present results for the total population. This includes respondents who were not asked these questions: for example, a respondent who answered no to having drunk beer in the past year was not asked about the amount of beer consumed. Form effects for only those respondents who answered these questions are even stronger.

Interaction among question structure, question length, and question wording in their impact on response effects has been an unexplored topic. The desire to evaluate interaction effects motivated this study's factorial design. Table 3 suggests that these factors do not interact. Only one



first-order interaction is significant and no second-order interactions reach significance. The isolated closure by length interaction for the masturbation frequency item seems to possess little pragmatic value.

This study's results add to the understanding of response effects for threatening questions, though the three hypotheses receive only mixed support. Threatening items which ask about having performed a behavior even once, and which require yes or no responses, are insensitive to question format manipulations. All three hypotheses must be rejected for these items. Threatening items which ask about frequency or intensity of behavior, and which require quantitative answers, are very sensitive to question structure and question length. Hypothesis 1 and Hypothesis 2 are supported for these items. Hypothesis 3 must be rejected, though consistent results suggest the wisdom of using familiar wordings. Also, interaction effects for these factors appear trivial.

Market researchers should find practical value in these findings. Product usage studies requesting data on sensitive articles such as many hygiene products probably encounter sizeable response effects because of the nature of the product. Any unwillingness to participate or to report product usage should remain insensitive to questionnaire manipulations. However, frequency and amount of usage should be more honestly reported in response to open-ended questions with innocuous padding. These product usage studies, as well as many other marketing and social marketing studies which deal with socially sensitive products or behaviors, should benefit from continued research and expanding knowledge about response effects.

#### Validation of Results

While there are strong reasons to believe that increases in reporting are improvements in reporting for threatening behaviors, one would like



direct proof. This study could not get validating evidence on an individual level. However, validating information is available on an aggregate level for the alcohol consumption items.

Since beer, wine and liquor are taxed, precise aggregate figures on U.S. production are available. These figures provide estimates for annual consumption, though these estimates will not precisely match reported consumption. U.S. production figures do not consider exports and imports. This factor probably is not too important for beer and liquor, but domestic wine production figures should considerably understate wine consumption. Also, production figures include institutional consumption (military bases, dormitories) which is not covered in a sample of households. Third, much beer and liquor consumption occurs out of the home, where it is subject to greater underreporting, so that reported consumption should fall short of production figures.

Table 4 presents the comparison of production figures with reported consumption. The Brewers Almanac 1975 (20) lists per capita production of 4,352 ounces of beer, 332 ounces of wine and 256 ounces of liquor. Reported consumption is converted to the same base by assuming that a can of beer contains 12 ounces, a glass of wine 4 ounces and a drink of liquor 1 ounce. The highest reported beer and liquor consumption reach only 65 and 62 percent of the production figures. Reported wine consumption slightly exceeds wine production, but not by the amount expected from foreign wine consumption. Some underreporting seems to remain even at the highest reporting level, indicating that increased reporting is improved reporting, not positively biased reporting.

Table 5 offers further comparisons with this study's results. Louis Harris (6) did a 1974 study for the National Institute on Alcohol Abuse and Alcoholism which contained drinking questions almost identical to the drink-



ing questions in this study. Harris' reported results cannot be converted into a total consumption estimate, so Table 5 presents comparisons of the frequencies of consumption. For all three items, the Harris results are about equal to the lowest results of this study. This outcome verifies the contention "that short, closed questions with standard wording get reporting levels equal to those of other surveys, and that these reporting levels can be much improved by using long, open questions with familiar wording.

A final validation is provided by Locander's (11) earlier study. Locander did have validation information for questions about having been convicted of traffic violations and about having gone through bankruptcy. Reporting of these events ranged from 27 to 75 percent across groups, showing that negative response effects are persistent for threatening questions.



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TABLE 1  
PERCENTAGE OF RESPONDENTS ANSWERING YES TO ITEMS BY FORM

<u>A. Gambling<sup>a</sup></u>	<u>Long</u>	<u>Short</u>		
	<u>Long-familiar</u>	<u>Long-standard</u>	<u>Short-familiar</u>	<u>Short-standard</u>
Have you played cards for money in the past year?	29.2	30.3		
Have you bet on sports?	19.8	17.4		
Have you bet on elections?	6.9	12.4		
Have you been in a betting pool?	17.2	16.2		
Have you played dice games for money?	6.2	7.8		
Have you bought a state lottery ticket?	25.2	23.9		
<u>B. Drinking<sup>b</sup></u>				
Have you ever drunk beer?	76.7		82.3	
Have you drunk beer in the past year?	59.8		65.8	
Have you ever drunk wine?	81.0		80.9	
Have you drunk wine in the past year?	64.8		62.5	
Have you ever drunk hard liquor?	79.8	82.5	85.7	81.0
Have you drunk hard liquor in the past year?	62.1	67.0	69.0	65.0

<sup>a</sup>Question structure and wording familiarity were not manipulated for these items.

<sup>b</sup>Question structure was not manipulated for these items. Wording familiarity was manipulated only for the hard liquor questions.



TABLE 1 (Cont.)

<u>C. Sexual Activity<sup>c</sup></u>	<u>Long-familiar</u>	<u>Long-standard</u>	<u>Short-familiar</u>	<u>Short-standard</u>
Have you engaged in petting or kissing in past month?	75.6		76.2	
Have you engaged in petting or kissing in past 24 hours?	41.8		35.1	
Have you engaged in intercourse in past month?	67.9	66.1	69.4	69.2
Have you engaged in intercourse in past 24 hours?	18.1	16.4	16.9	15.8
Have you masturbated in past month?	10.9	11.1	10.9	7.0
Have you masturbated in past 24 hours?	1.7	1.4	1.4	.3

<sup>c</sup>Question structure was not manipulated for these items. Wording familiarity was not manipulated for the petting and kissing items.



TABLE 2  
MEANS FOR DRINKING AND SEXUAL ACTIVITY FREQUENCY ITEMS BY FORMS

Drinking Items

Total cans of beer drunk per person in past year<sup>a</sup>

	<u>Open</u>	<u>Closed</u>	Length means
<u>Long</u>	235	173	203
<u>Short</u>	225	110	167
Structure means	230	142	

Total glasses of wine drunk per person in past year<sup>a</sup>

	<u>Open</u>	<u>Closed</u>	Length means
<u>Long</u>	91	57	74
<u>Short</u>	63	36	49
Structure means	77	47	

Total drinks of hard liquor per person in past year

	<u>Open</u>	<u>Closed</u>	Length means
<u>Long</u>	Familiar	158	129
		115	129
<u>Short</u>	Familiar	126	90
		141	106
Structure means	135	100	

<sup>a</sup>Wording familiarity was not manipulated for these items.



TABLE 2 (Cont.)

SEXUAL ACTIVITY ITEMS

Total number of times respondent engaged in petting or kissing in past year<sup>a</sup>

	<u>Open</u>	<u>Closed</u>	Length means
Long	167	155	161
Short	149	139	144
Structure means	158	147	

Total number of times respondent engaged in intercourse in past year

	<u>Open</u>	<u>Closed</u>	Length means
<u>Long</u>	Familiar	90	71
		76	76
<u>Short</u>	Familiar	69	75
		71	63
	Structure means	77	69

Total number of times respondent masturbated in past year

	<u>Open</u>	<u>Closed</u>	Length means
<u>Long</u>	Familiar	13.8	3.8
		9.4	5.2
<u>Short</u>	Familiar	6.4	6.9
		1.1	4.7
	Structure means	7.7	5.2

<sup>a</sup>Wording familiarity was not manipulated for these items.



TABLE 3  
ANALYSES OF VARIANCE FOR DRINKING AND SEXUAL ACTIVITY FREQUENCY ITEMS

Drinking items

Total cans of beer drunk per person in past year<sup>a</sup>

<u>Source of Variation</u>	<u>F</u>	<u>d.f.</u>	<u>Significance</u>
Closure	14.78	1	.001
Length	2.52	1	.108
Closure-length	1.35	1	.243
Residual		1149	

Total glasses of wine drunk per person in past year<sup>a</sup>

<u>Source of Variation</u>	<u>F</u>	<u>d.f.</u>	<u>Significance</u>
Closure	8.38	1	.004
Length	5.57	1	.02
Closure-length	.08	1	.99
Residual		1147	

Total drinks of hard liquor per person in past year

<u>Source of Variation</u>	<u>F</u>	<u>d.f.</u>	<u>Significance</u>
Closure	4.59	1	.03
Length	1.99	1	.155
Wording	.96	1	.99
Closure-Length	1.49	1	.221
Closure-Wording	.03	1	.99
Length-Wording	.51	1	.99
Closure-Length-Wording	1.00	1	.32
Residual		1146	



TABLE 3 (Cont.)

SEXUAL ACTIVITY ITEMS

Total number of times respondent engaged in petting or kissing in past year<sup>a</sup>

<u>Source of Variation</u>	<u>F</u>	<u>d.f.</u>	<u>Significance</u>
Closure	1.72	1	.187
Length	3.73	1	.05
Closure-Length	.015	1	.99
Residual		1141	

Total number of times respondent engaged in intercourse in past year

<u>Source of Variation</u>	<u>F</u>	<u>d.f.</u>	<u>Significance</u>
Closure	2.04	1	.149
Length	1.62	1	.20
Wording	1.47	1	.223
Closure-Length	1.19	1	.275
Closure-Wording	.02	1	.99
Length-Wording	.09	1	.99
Closure-Length-Wording	1.36	1	.242
Residual		1124	



Total number of times respondent masturbated in past year

<u>Source of Variation</u>	<u>F</u>	<u>d.f.</u>	<u>Significance</u>
Closure	1.58	1	.207
Length	2.72	1	.095
Wording	1.83	1	.173
Closure-Length	5.39	1	.02
Closure-Wording	1.31	1	.251
Length-Wording	.34	1	.99
Closure-Length-Wording	.12	1	.99
Residual	1140		

<sup>a</sup>Wording familiarity was not manipulated for these items.



TABLE 4  
COMPARISON OF REPORTED DRINKING TO U.S. PRODUCTION

	Ounces of reported beverage consumption per person by form	U.S. taxed production of beverage in ounces per person
A. Beer		
	<u>Open</u>	<u>Closed</u>
Long	2,820	2,076
Short	2,700	1,320
		4,352
B. Wine		
	<u>Open</u>	<u>Closed</u>
Long	364	228
Short	252	144
		332
C. Hard Liquor		
	<u>Open</u>	<u>Closed</u>
Long		
Familiar	158	129
Standard	115	115
		256
Short		
Familiar	126	90
Standard	141	66



TABLE 5

COMPARISON OF REPORTED DRINKING FREQUENCY TO HARRIS DRINKING FREQUENCY DATA

Total number of times average respondent drank beverage in past year.

		<u>Estimates by form</u>	<u>Harris estimate</u>
		<u>Open</u>	<u>Closed</u>
A. Beer			
	Long	74.22	52.41
	Short	69.84	38.25
			30.49
B. Wine			
	Long	37.14	20.71
	Short	28.33	17.31
			16.32
C. Hard Liquor			
	Long		
	Familiar	47.76	40.31
	Standard	35.99	41.86
			26.98
	Short		
	Familiar	43.53	25.00
	Standard	41.73	22.23













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